

**SALMOPERLA, A NEW STONEFLY GENUS FROM NORTHERN
CALIFORNIA (PLECOPTERA: PERLODIDAE)**

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Abstract.—*Salmoperla* is designated as a new genus in the subfamily Perlodinae, tribe Arcynopterygini, with the new species *Salmoperla sylvanica* as the type species. A brief description of the genus is given that includes characters that delineate it from the other genera in Perlodinae. *Salmoperla sylvanica* is described for the adult male and mature male and female nymphs. Illustrations are provided, along with a diagnosis that compares it with *Oroperla barbara* and *Perlinodes aureus*.

During the spring of 1984 Peter Wilkinson did extensive collecting of stonefly nymphs and adults in the Willow Creek drainage in Humboldt County, California (Wilkinson, 1986). His study was restricted to Willow Creek and several tributaries above the confluence with the Trinity River. He obtained several nymphs and a single male adult of a peculiar perlodid species that he had trouble identifying correctly. This interesting large stonefly could not be classified even to the generic level by using the recent key to North American Perlodinae genera (Stewart and Stark, 1984). In addition, another population of nymphs was discovered in a 1981 collection from a tributary of the Klamath River north of the Hoopa Indian Reservation.

These events led to the organization of a special field trip in April 1987 for the express purpose of collecting additional specimens of this interesting stonefly. Three researchers from Brigham Young University: R. W. Baumann, C. R. Nelson, and S. A. Wells; B. P. Stark from Mississippi College, and D. A. Lauck from Humboldt State University joined together to learn more about

this stonefly and attempted to collect an adult female. However, we only succeeded in collecting an additional male adult and mature nymphs from several localities. Because nymphs of this species were studied by K. W. Stewart and B. P. Stark as part of their survey of the nymphs of North American Plecoptera, it was decided that a description of this previously undescribed genus and species should be done now so it can be included in their forthcoming book on stonefly nymphs.

***Salmoperla* Baumann and Lauck,
NEW GENUS**

Type species.—*Salmoperla sylvanica* Baumann and Lauck, new species.

Size.—Large: adult male 22–25 mm; female unknown; mature nymphs 25–37 mm.

Gills.—Submental (SM) small and triangular; anterior thoracic (AT₁) tiny; prothoracic (ASC₁) small and single; meso (AT₂) and meta thoracic (AT₃) double, large and finger-like (Fig. 2).

Mesosternum of nymph.—Arms of Y-ridge meet posterior corners of furcal pits (Fig. 2).

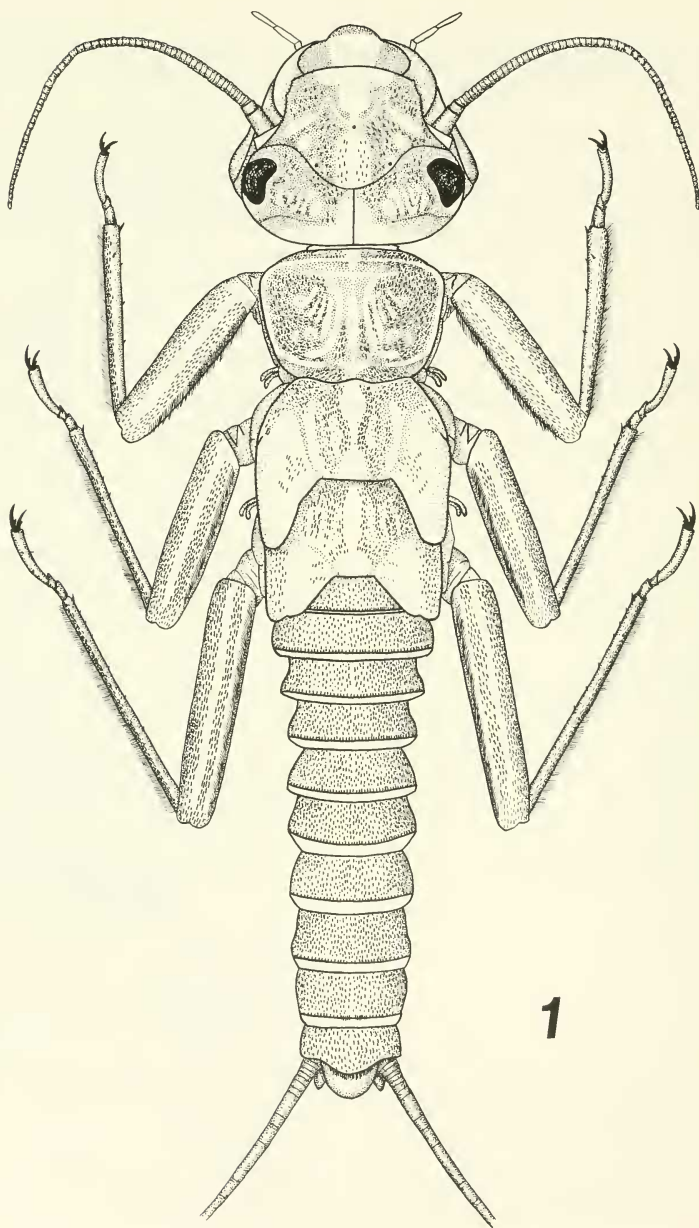


Fig. 1. *Salmoperla sylvanica*, mature nymphal habitus.

Genitalia.—Epiproct large, darkly sclerotized and covered with short, stout spinules; lateral stylets present and well developed.

Nymphal mouthparts.—Lacinia bidentate, with fringe of thin spinules on inner margin; right mandible moderately cleft with small denticles on ventral teeth (Figs. 5, 6).

Distribution.—Northern Carolina.

***Salmoperla sylvanica* Baumann and Lauck,
NEW SPECIES**

Figs. 1–11

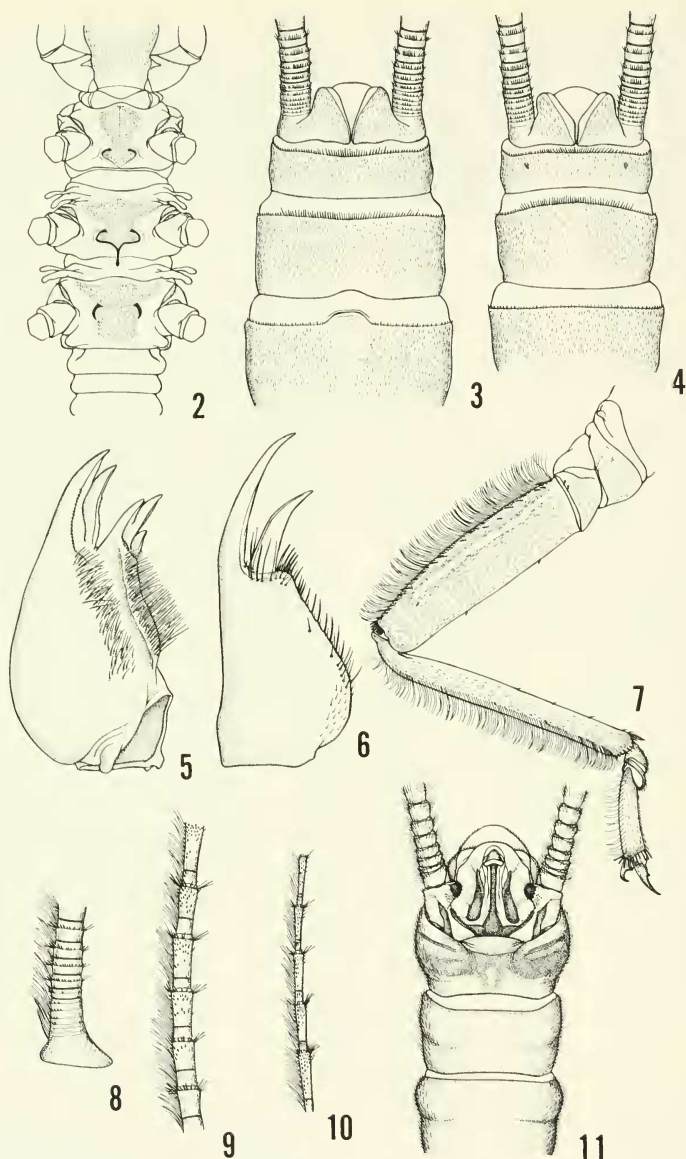
Male.—Slightly brachypterous. Length of forewings 15–17 mm; length of body 22–25 mm. General color dark brown but with yellow markings; legs yellow with brown areas at joints; antennae dark brown. Head wider than prothorax, mostly yellow but with dark brown areas laterally behind eyes. Pronotum wider than long, brown, with broad median yellow stripe, which extends onto mesonotum. Wings clear, veins brown, numerous crossveins and small cells present. Abdominal terga dark brown, with paired light colored patches on first four segments; sterna yellow. Cerci light brown. Ninth sternum enlarged, extending posteriorly over base of paraprocts; ninth tergum with enlarged lateral humps, covered with small stout setae and long fine hairs. Tenth tergum with moderate-sized genital lobes, narrowly rounded, tips of lobes darkly sclerotized and bearing a few short, stout setae (Fig. 11); paragenital plates darkly sclerotized, basal sclerotizations as flattened three-pronged fork, lateral sclerotized bars large and expanded at base. Epiproct large and almost completely sclerotized, broadest at base, tapering to narrower truncate tip, which is membranous, dorsal anterior half of epiproct covered with small dark spinules. Lateral stylets, short broad and darkly sclerotized, apex shaped as stout outward directed hook.

Female.—Unknown.

Nymph.—Length: mature males 25–30 mm; mature females 32–37 mm. Dorsal color brown with light paisley patterns dor-

sally (Fig. 1). Head with light colored areas on median of labrum and anterior portion of head beyond ocelli, ovoid light area in ocellar triangle, large light areas on posteriolateral margins behind compound eyes; antennae light brown. Pronotum lighter medially and darker near lateral margins. Mesonotum, metanotum and abdominal terga basically brown, with faint median stripe. Ventral color pattern much lighter with distinctly sclerotized areas on thoracic sterna. Cerci light brown. Abdominal segments one to seven with enlarged membranous areas on lateral margins, best developed on anterior segments and gradually becoming smaller posteriorly. Mandibles and maxillae greatly enlarged laterally and visible in dorsal view. Lacinia bidentate, with only thin spinules on inner margin (Fig. 6). Right mandible moderately cleft, with small denticles on ventral teeth and small patch of tiny denticles at base of dorsal teeth, fringes of hairs present on inner margins of both teeth below cleft (Fig. 5). Legs covered by numerous short spinules, bearing short but heavy lateral fringe of hairs (Fig. 7). Abdominal segments covered with short intercalary spinules, terminal sterna bearing fringe of posterior spinules (Fig. 4), fringe interrupted on females where truncate lobe occurs along posterior median margin of eighth sternum (Fig. 3). Cerci with lateral fringe of long fine hairs, basal segments very short and tightly compacted, bearing few short stout spinules on posterior margin, occasionally larger lateral spines present (Fig. 8), middle segments with intercalary spinules and small setae, lateral spines larger and forming whorls along posterior margin (Fig. 9), terminal segments with intercalary setae and well developed whorls of spines at apex of each segment (Fig. 10).

Diagnosis.—*Salmoperla sylvanica* belongs to the perlodine tribe Arcynopterygini (Stark and Szczytko, 1984). Its sister species is *Oroperla barbara* Needham, which was described from the nymphal state because of its distinctive abdominal gills (Needham, 1933). *Salmoperla* has the same pattern of



Figs. 2-11. *Salmoperla sylvanica*: 2, Nymphal thoracic sterna. 3, Female nymph, terminal abdominal sterna. 4, Male nymph, terminal abdominal sterna. 5, Right nymphal mandible, ventral. 6, Right nymphal lacinia, ventral. 7, Right front leg, nymph, dorsal. 8, 9, 10, Basal, middle and apical cercal segments, nymph. 11, Male terminalia, adult, dorsal.

nymphal gills on the submentum and thoracic sterna (Shepard and Stewart, 1983) and it has large, expanded membranous areas on abdominal segments one to seven, where *Oroperla* has paired gills. These genera have very similar mandibles and maxillae, which are also greatly expanded laterally and are easily visible in dorsal view. The males are very similar in size and basic morphology, including their wings in both size and venation. Their genitalia are also rather similar and they both have short, stout lateral stylets. *Salmoperla* has a much larger epiproct but it is structurally similar to that found in *Oroperla*. Even though these genera are relatively similar, the differences, especially in the gills, are large enough to warrant the naming of a new genus. The only other species that is at all similar to *S. sylvanica* is *Perlinodes aureus* (Smith). *Perlinodes*, however, has the thoracic gills single and some peculiar, derived male characters that are absent in *Salmoperla* (Stark and Stewart, 1982).

Types.—Holotype ♂, stream one-third mile west of Ruby Creek, Hwy 299, above junction Willow Creek, Humboldt County, California, 25 April 1987, R. W. Baumann, C. R. Nelson, B. P. Stark, and S. A. Wells. Paratype ♂, stream one-half mile east of Cedar Creek, Hwy 299, above junction Willow Creek, Humboldt Co., California, 20 April 1984, P. Wilkinson (BYU). Nymphs examined: California: Humboldt Co.: stream north of Fish Lake above junction Bluff Creek, 11 April 1981, D. A. Lauck, 10 nymphs (BYU, HSU, NTSU); same locality, 24 April 1987, Baumann, Nelson, Stark and Wells, 11 nymphs (BPS, BYU); stream one-half mile east of Cedar Creek, Hwy 299, above junction Willow Creek, 25 April 1987, Baumann, Nelson, Stark and Wells, 5 nymphs (BPS, BYU); stream one-third mile west of Ruby Creek, Hwy 299, above junction Willow Creek, 25 April 1987, Baumann, Nelson, Stark, and Wells, 7 nymphs (BYU, USNM). Nymphs are recorded in Wilkinson (1986) from some additional localities in the Willow Creek drainage. Ho-

lotype deposited at the National Museum of Natural History, Smithsonian Institution, Washington, D.C. Collection abbreviations: BPS, Bill P. Stark, Mississippi College, Clinton, Mississippi; BYU, Brigham Young University, Provo, Utah; HSU, Humboldt State University, Arcata, California; NTSU, North Texas State University, Denton, Texas; USNM, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Etimology.—The generic name *Salmoperla* is based on the observation that individuals of this genus seem to occur only in pristine trout streams. Sylvan is the stem for the specific name and it refers to the fact that all the streams that contain *Salmoperla sylvanica* are located in mesic, heavily wooded areas in the Trinity Alps area of Six Rivers National Forest.

Ecological notes.—*Salmoperla* has only been collected in small tributary streams of larger creeks that soon join large rivers. In every case the stream above the collecting site is very steep and then levels out for a relatively short distance before becoming torrenticolous again. The nymphs are found only in loose gravel-rubble areas with a moderate rate of flow.

ACKNOWLEDGMENTS

We are grateful to Peter Wilkinson for collecting the first adult specimen of *Salmoperla sylvanica* and several nymphs, which started us on this exciting study. Special thanks are given to our colleagues C. Riley Nelson, Bill P. Stark, and Samuel A. Wells, who were members of the collecting team that searched for the elusive *Salmoperla* in April 1987. Finally we appreciate the excellent illustrations that were made by Jean A. Stanger, except for the habitus nymph, which was done by the junior author.

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NOTE

Accuracy in reporting types

I have recently made a card file for several hundred new holotypes described by about twenty authors during the past few years. The cards record the references to the original descriptions and the data on the holotypes. Comparing data on the pin labels with the data reported in the original descriptions reveals discrepancies in about three per cent of the cases, not just free interpretations of pin label data but actual disagreements. When data on the holotypes and those in the publications do not agree there is a question whether the specimen labeled holotype is the correct one. Did the author make a careless mistake in copying the data, or did he label the wrong specimen

as holotype? If some paratype bears the data reported for the holotype and the specimen labeled holotype does not, is that paratype the true type? When the labeled holotype has data different from the data published, some later investigator could correctly (or incorrectly?) conclude that the true type is lost.

This note is to show the need for care when reporting data on types. A common mistake is to report an incorrect date of collection.

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